

What is claimed is:

1. A process for polymerizing an olefin comprising polymerizing or copolymerizing an olefin at a polymerization reaction temperature of 50 to 200 °C in the presence of an olefin polymerization catalyst comprising:

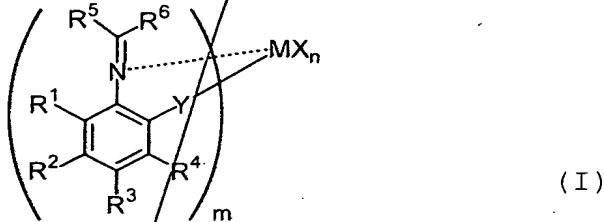
(A) a transition metal compound represented by the following formula (I),

(B-1) a compound having a reduction ability which reacts with the transition metal compound (A) to convert an imine structure moiety to a metal amide structure, and

(B-2) a compound which reacts with the transition metal compound (A) to form an ion pair;

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B17*

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wherein M is a transition metal atom of Groups 3 to

20 11 of the periodic table,

m is an integer of 1 to 6,

Y is an oxygen atom, a sulfur atom or a selenium atom, or a nitrogen atom having a substituent R⁷,

R¹ to R⁷ may be the same or different, they are each 25 a hydrogen atom, a halogen atom, a hydrocarbon group, an oxygen-containing group, a nitrogen-containing group, a

boron-containing group, a sulfur-containing group, a phosphorus-containing group, a heterocyclic compound residual group, a silicon-containing group, a germanium-containing group or a tin-containing group, two or more of them may be bonded to each other to form a ring except for the case where R¹ and R⁵ or R¹ and R⁶ are bonded to each other to form an aromatic ring, and when m is 2 or greater, one group of R¹ to R⁷ contained in one ligand and one group of R¹ to R⁷ contained in other ligands may be bonded, and R¹s, R²s, R³s, R⁴s, R⁵s, R⁶s and R⁷s may be the same or different,

n is a number satisfying a valence of M, and

X is a hydrogen atom, a halogen atom, a hydrocarbon group, an oxygen-containing group, a nitrogen-containing

group, a boron-containing group, a sulfur-containing group, a phosphorus-containing group, a halogen-containing group, an aluminum-containing group, a heterocyclic compound residual group, a silicon-containing group, a germanium-containing group or a tin-containing group, and when n is 2 or greater, plural groups indicated by X may be the same or different, and plural groups indicated by X may be bonded to each other to form a ring.

2. The process for polymerizing an olefin as

25 claimed in claim 1, wherein the transition metal compound

(A) is a compound in which R⁴ in the above formula (I) is a halogen atom, a hydrocarbon group, an oxygen-containing group, a nitrogen-containing group, a boron-containing group, a sulfur-containing group, a phosphorus-containing group, a heterocyclic compound residual group, a silicon-containing group, a germanium-containing group or a tin-containing group.

3. The process for polymerizing an olefin as
10 claimed in claim 1 or 2, wherein the olefin polymerization catalyst is a catalyst comprising the transition metal compound (A), the organic metal compound (B-1), the compound (B-2) which reacts with the transition metal compound (A) to form an ion pair, and a carrier (C).

4. The process for polymerizing an olefin as
claimed in any one of claims 1 to 3, wherein the yield of polyolefin per 1 mol of a transition metal atom contained in the transition metal compound (A) and 1 hour of a
20 polymerization time is 1000 kg or more.